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PROJECTS IN SCIENCE AND NATURE STUDY

SHOWN AT

THE AMERICAN INSTITUTE CHILDREN'S FAIR

1930

ARRANGED BY

SCHOOL NATURE LEAGUE

SPONSORED BY AND HELD AT

THE AMERICAN MUSEUM
OF NATURAL HISTORY

SCHOOL SERVICE SERIES NUMBER SIX
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1931

The American Institute

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American Museum of Natural History

Dr. Henry Fairfield Osborn, *President*
Dr. George H. Sherwood, *Director*

WHEAT

Exhibit by the Bureau of School Farms, New York City, Department of Parks

Projects in Science and Nature Study

edited by

Marjorie C. Coit

Director, School Nature League
Chairman, Children's Fair

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INTRODUCTION

The third American Institute Children's Fair, arranged by School Nature League, was sponsored by and held at the American Museum of Natural History, December 4–10, 1930. The American Institute has held county fairs in New York City since 1828, but only during the past three years has a fair been entirely the expression of the science interests of boys and girls. This has been a new departure in fair holding and the experiment has been watched with great interest to determine its value from the educational standpoint. The object of the exhibit is to focus attention on the sciences and to foster a scientific interest in agriculture, gardening, nature study and conservation.

We are living in a civilization characterized by its scientific achievements, and are surrounded by devices and equipment that are the result of years of research. It might be possible for many of us to live in the midst of the marvels of nature and of man and, closing our minds to why and how, to press a button or turn a switch and find the miracles of modern civilization appear and disappear. But how meager an existence this would be! We thereby put ourselves back on the primitive plane where superstition rules and interpretation and true understanding have found no foothold. Education recognizes the importance of this comprehension of the world about us and strives so to teach that in the future the average man and woman will have an acquaintance with the history and results of scientific research and some feeling for the handling of scientific tools.

The American Institute Children's Fair is planned to help teachers and students enrich their scientific interests by giving an incentive for carefully completed work, and by exhibiting it in such a way that other students and teachers may find suggestions and inspiration. The progressive improvement of the exhibits at the Children's Fairs has indicated that these purposes are being realized. More and more schools have exhibited their work until, in 1930, ninety-seven schools were represented by exhibits, while the work shown has steadily improved in quality as well as in quantity.

At the close of the 1930 Fair, regret was expressed that the excellent work shown should no longer be available for study, but must be returned to the exhibitors. After consideration, a request for a report on the exhibition was sent to a small list of prize winners whose work was felt to be most original and most helpful in its presentation. There has been an immediate response from most of these schools and organizations.

The opinions of the judges of the exhibits at the Children's Fair have largely been followed in requesting the reports of the exhibits. In a few cases the winners of first, second, and third places have all been asked to contribute to this booklet. It has been found necessary to limit the number of reports, and some classes have not been reviewed, due to a feeling that, though the work was excellent, it might not have sufficient originality of expression to make this report of it necessary.

It is hoped that in offering these plans of the projects at the 1930 Children's Fair they will not thereby become models for copies. They are designed rather as suggestions from which students and teachers may find ideas or mechanical devices that may prove useful in the development of new projects. Some ingenious expressions and phrases that have been used are worthy of reproduction, and some techniques have been developed that have proved serviceable.

The worth of the Fair to the schools may be gauged by the letters from teachers who have found that the Fair stimulated the interest of pupils, and by the improvement in the work shown from year to year. This improvement has been so great that there can be no question that student exhibitors are visualizing their science problems more clearly and presenting them more forcefully than was done in preceding years.

It is necessary to guard against a presentation that is more dramatic than scientific, and more showy than sincere. Careful, thoughtful work may not be as attractive to the passerby as a vivid, but unscientific appeal. The task of the judges is to withhold rewards from such exhibits and to make sure that the scientific aims of the Fair are always emphasized by giving recognition to the intelligent presentation of sound ideas. To insure this point of view, the judges have been selected from scientists, educators, and other specialists who are well acquainted with the problems of the Fair. These men and women take their responsibilities most seriously, and, in presenting the selections made by them, one may be assured of wise and considered judgment.

The exhibits were judged on the following bases:

1. General educational value. 2. Clearness of objective. 3. Accuracy of information. 4. General attractiveness, neatness and care. 5. Originality. 6. Effective presentation of material. Originality was valued highly, if scientific accuracy was not sacrificed to gain it, and the student's first hand record of observations was considered of more worth than copied diagrams.

The reports of group exhibits which follow are usually made by the teacher or organization leader in charge of the project. Exhibits prepared by individuals were reviewed by the boy or girl who made the exhibit. In requesting these reports several headings were suggested which covered the information needed:

1. Scientific objective of the exhibit. What connection did this project have with your science or nature study program? Is it related to other, larger objectives?
2. Brief description of the exhibit.
3. Material used:
    Natural and living material. How cared for?
    Artificial materials. What? How prepared?
    Sources from which your material was obtained.
4. Labels. Please give labels in full. Their place on the exhibit.
5. Sketch of the exhibit showing placing of material and labels
6. Any photographs you have of it.
7. Age of pupils preparing the exhibit.
8. Number of pupils involved.

In so far as possible the reports have been printed just as they were sent in. In some cases editing has been necessary and errors in information have been corrected in order to avoid misconceptions on the part of students who might wish to use the book as a guide.

In this booklet the three organizations interested in the Children's Fair have again cooperated to make the publication possible. The editor of the manuscripts wishes to thank the exhibitors who have taken so much thought in order to make the report a success. Special thanks are also due Dr. S. Ralph Powers of Teachers College, whose suggestions and interest have always been an inspiration.

MARJORIE C. COIT.

PROJECTS IN SCIENCE AND NATURE STUDY

ELEMENTARY SCHOOLS

Grades 1 to 6

GROUP ENTRY CLASSES

Children's Fair Requirements, Group Entry Class I E:

How Plants and Animals Live.—The best exhibits illustrating a biological principle; as adaptation, including protective coloration, seasonal change, adaptation to food-getting, care of the young, etc. Labels should be brief but should state clearly the intent of the exhibit.

HOW TREE FROGS ARE PROTECTED BY CHANGING COLORS

The exhibit consisted of two terraria made by the boys. In one were green plants, moss, a small dish of water, and a ladder about 8 inches long, painted green. This ladder was for the frog to climb on. In this terrarium lived the tree frog who always stayed green. We kept that terrarium in a warm sunny place.

The other terrarium was the home of the tree frog who lived in a dark brown background and changed from dark slate color to light yellow. The bottom of the terrarium was covered with soil and in it were a piece of mica schist 2×4 inches, a dish of water, some bark covered with lichens, and an unpainted ladder similar to the one in the other terrarium. We kept this terrarium in the shade, and when we wanted to see the change we put it in the sun. The explanatory labels were as follows:

Tree Frog. Protective Coloration.

Some animals change their color as they move from a dark background to a light one. They change color to harmonize with the color of their environment.

This makes them hard to find and protects them against their enemies.

These animals are usually quiet, gentle, and not easily frightened.

Change of color.—Gray or brown, caused by darkness, moisture, low temperature. Light color caused by bright sunshine, lack of moisture, high temperature.

Color is due to the black pigment cells in the skin which are just beneath the thin, colorless epidermis. These cells expand and contract. When, in answer to some stimulus, they expand, numerous radiating branches develop which make the skin appear darker in color. When they contract strongly, it becomes lighter. This explains the brown and gray changes. The greens are due to a layer of other pigment cells, mainly yellow, acting with the black.

The frog in the brown terrarium is dark slate color when he is in the shade and around the rocks. Sometimes we put him in the sun. He changes to the color of the ladder, light yellow. The change takes about one hour. The other frog is green because we keep him in a green terrarium and in the sun.

The discs on their toes make them stick to things easily. This makes climbing trees very simple for them.

Both frogs like to rest on the glass at the side of the terrarium.

We feed them flies, and how they jump when they see them! Their legs enable them to jump several feet.

Blanche V. Levy,
Teacher in charge of exhibit
P. S. 158, Manhattan,
G. L. Weinberger, Principal.

⁂

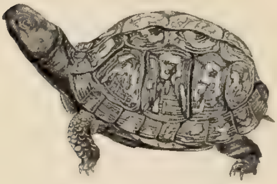
CHILDREN'S FAIR REQUIREMENTS, GROUP ENTRY CLASS I E.

HOW PLANTS AND ANIMALS LIVE.—The best exhibits illustrating a biological principle; as adaptation, including protective coloration, seasonal change, adaptation to food-getting, care of the young, etc. Labels should be brief but should state clearly the intent of the exhibit.

TURTLES AND THEIR HABITS

The two turtles we exhibited were kept in a large terrarium. In one corner was a large dish of water and the rest of the terrarium was covered with moss. The snapper preferred the water, while the box turtle stayed on the moss. We had a chart comparing various facts about the two turtles, as follows:

Turtles.—Two kinds of turtles, closely related, survive because of entirely different ways in which they protect themselves against attack.



BOX TURTLE

Where found: On land, in open ground. *Toes:* Five toes to tear food. *Distinctive characteristics:* High arched back, blunt middle ridge, lower shell hinged to close even with upper. *Protection:* Goes into shell, closing hinged part of lower shell. *Disposition:* Gentle, retiring. *Food:* Plants, worms, insects, slugs. *Use to nature:* Helps control multiplication of smaller land animals. *Use to man:* Helpful destroyer of slugs and insects. Good for food.

SNAPPING TURTLE

Where found: Sluggish rivers, ponds. *Toes:* Partly webbed to swim. *Distinctive characteristics:* Upper shell covers body, lower shell covers only a small part of body. *Protection:* Great fighter, sharp hooked beak. Can be handled safely only by tail. *Disposition:* Very vicious. *Food:* Fish, animal life. *Use to nature:* Controls multiplication of water life, scavenger. *Relation to man:* Destroyer of fish and fowl. Excellent food.

BLANCHE V. LEVY,
Teacher in charge of exhibit,
P. S. 158, Manhattan,
G. L. Weinberger, Principal.

Children's Fair Requirements, Group Entry Class II E:

Value and Protection of Trees and Flowers.—The best exhibits showing the care and value of forests, or of individual trees, or of flowers.

THE VALUE AND PROTECTION OF FORESTS

In preparing the project we held many socialized recitations, during which leading questions were propounded and solved by the pupils. Among these problems were: "What would our climate be like if we had no forests?" "Of what material would our homes be made if we had to live in an arid region?" "Why should deforestation affect movements of population?" "Where might we find a region such as we are demonstrating?" "What actual characteristics does this region have?" Tie-ups were made with floods and forestation in Germany, Switzerland, China, and the United States, and with the Conservation Commission, U. S. Forestry Service, etc. Industries affected by forestry problems, government attitude towards them, and methods of conservation were studied.

In this way the project was linked to the larger objectives of the term's work in history, geography, and nature study. By asking for written reports, English composition was brought in.

We prepared an exhibit to contrast two areas. On one hand we saw, in miniature, a well-wooded forest. In the depths of the woods stood a lumber man at work near his log cabin. A placid river issued from a background of tall trees. As it reached the foreground, it moistened the cleared ground of a prosperous farm on which were sleek cattle, well-cultivated rows of vegetables, corded wood, and neatly kept farm houses. The relationship between the wooded headwaters of the stream and the arable land below was shown by the following labels:

1. Fertile farms. The humus remains and the top soil is deep. 2. Floods are prevented. Water runs off slowly. 3. The surface is covered with leaf mulch. This prevents evaporation. 4. Trees break the force of the wind. 5. Forests are a source of lumber. 6. Forests shelter animal life. 7. The air of forests is pure and fresh.

The other half of the exhibit presented the contrast. Rocky hillsides, dry gullies and flooded lowlands were shown. The ground was rocky, bare and brown. Rivers and streams were turbulent and flowed between deeply cut banks. The results of previous folly were indicated in the charred remains of a fire-swept region and the stumps and debris of selfishly cut stands of timber. A tumbledown shack with a "To Let" sign emphasized a feeling of loneliness, waste and desolation. The labels used in this deforested region were:

1. Wasteful lumbering ruins forests. 2. Fires may cause floods. 3. Wild life finds less shelter. 4. Hillsides are quickly worn away. 5. Rain and snow water run quickly off the hard ground. This results in spring floods and summer droughts.

As a foundation for building the exhibit, wet newspaper was torn into very small bits. This papier-maché was then modelled into ridges and valleys. Before the ground was fully dry, models of trees were inserted. These were made of small bits of sponge, painted green, and affixed to slender sticks. The ground was then painted green and, while still wet, sand was dropped over it. Silver paint on pieces of glass was used for the streams and ponds.

Three of the houses were made of oak-tag, while the log cabin had a paper foundation with small twigs of equal size stitched upon it.

The figures of men and animals were bought at the Five and Ten Cent Store, or brought by the pupils. The rafts on the stream and the tree stumps found in the denuded region were twigs that the children brought from their back yards.

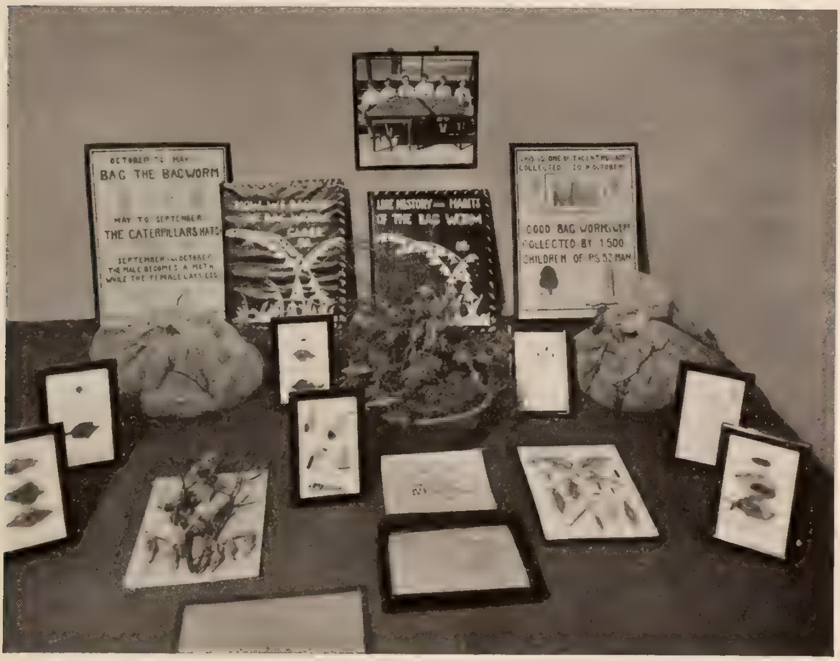
The average age of the 80 pupils was about eleven years.

Pearl Manton, in charge of exhibit,
Grades 6B1 and 6B3,
P. S. 205, Brooklyn,
Joseph Griffin, Principal.

⁂

Children's Fair Requirements, Group Entry Class IV E:

Value and Care of Our Parks and Roadsides.—The best exhibits showing how parks and roadsides may be made and kept beautiful, and what responsibility the public, and particularly boys and girls, have toward our parks and countryside.



LIFE HISTORY OF THE BAG-WORM AND ITS CONTROL

In this part of Manhattan there are many trees. For the past five years they have been infested by bag-worms. For this reason the children of Public School 52, Manhattan, decided to combine nature and civics in their project for the Children's Fair and thus save our beautiful trees. Our principal offered a prize to the boy or girl who would gather the greatest number of bag-worms.

The contest was open to the whole school. Fifteen hundred children participated. "Bag the bag-worm!" was our slogan. The enthusiasm was all that could be desired. As the days were still favorable for nature excursions, the contest offered a good motivation for these trips and afforded an opportunity to learn the identification of our tree neighbors.

Each morning the previous day's harvest was counted and recorded. When the contest closed in May more than thirty thousand bag-worms had been collected. The winner of the contest was awarded a gold medal by The Society for the Protection of the Trees of Riverside Drive, and a year's subscription to *Nature Magazine* was second prize.

Our next task was the proper disposition of our collection. The Department of City Parks solved the problem for us. They called for the bag-worms and confined them in receptacles until the parasites appeared and then the cases were destroyed. Imagine the delight of the children when they received a full page letter from the Commissioner of Parks commending them for the excellent work they had done.

Our interest was not confined simply to the collection of the bag-worms. Specimens were placed in an insect cage under the observation of a 5A class. Great was the excitement when one warm spring day the small parasites emerged from their dark cases and began their work of eating the eggs of the bag-worms. The cage was carried from classroom to classroom so that all the children might have the privilege of seeing them. These flies and their pupæ, properly mounted, were a part of our exhibit at the Children's Fair.

The project proved valuable as a means of correlation of English, geography, and drawing. Our observations were recorded by illustrations, and posters were made showing trees denuded and otherwise. Maps were drawn of the parts of the United States invaded by these tree destroyers.

Next to nature the English subject received the greatest value from the project. Letters were written to the various city departments and organizations. One was mailed to the Davey Tree Surgery Company asking them to broadcast our project. A diary was made of each day's progress; a playlet was written and dramatized for an assembly program. Poetry appeared in the school magazine. Our nature trips provided subjects for compositions and an 8B class prepared a booklet on the life history and habits of the bag-worm.

Every conceivable phase of the bag-worms was studied. Cases were cut open and their contents noted under a microscope. The American Museum of Natural History assisted with literature and a photographic plate of the bag-worm in its process of destruction. These were of great value in verifying deductions from our observations so that we were able to prepare intelligently an exhibit of the full cycle of development.

The project has proved to be a great incentive for future work along similar lines. Both the children and I have taken much pleasure in this work.

Sarah B. MacGowan,
Teacher in charge of exhibit,
P. S. 52, Manhattan,
Benton Louis Snyder, Principal.

Children's Fair Requirements, Group Entry Class V E:

Improvement of Our Health.—The best exhibits showing some phase of public or individual health improvement; first-aid, safety, etc.

THE SURELY WIN (SHIRLEY WYNNE) HEALTH HOUSE

The project included all of the health education course of study as outlined for grades one through six, and aroused interest in unified health teachings. Art, handwork, composition, literature and civics were correlated with the work.

The exhibit illustrated the important rules for cleanliness and good health, and represented a health house of four rooms and bath. A Tom Thumb Golf Course at the front represented play and exercise. A glorious red sun shone in the heavens above a health mountain in the background.

At the front of the house at the left was a bedroom with a child asleep in bed. The window was opened at the top with a ventilator at the bottom. The child's clothing was hung to air on the back of a chair near the open window. The thermometer on the wall read 58°. Sleep with fresh air and proper ventilation was illustrated.

At the right was the living room. Here a father was seated on a settee playing a ukulele, while the mother sat near by with two other children. A younger member of the family was playing the piano while her sister danced. Recreation and contented mind were the activities illustrated.

In the rear at the right, the dining room showed a balanced diet on the table with two members of the family enjoying it.

The kitchen was at the left, with food neatly arranged in the refrigerator and in the kitchen cabinet. The kitchen illustrated cleanliness in the care and preparation of food.

The bathroom represented personal cleanliness, bathing, care of the teeth and hair.

Each room was made as attractive as possible. The furnishings were constructed in proportion as well as primary and grammar school children could do it.

The house had seven windows, each having transparent panes, shades, ventilators, and attractive curtains.

All of the modern household appliances were represented. There were electric cooking utensils, a vacuum cleaner, a radio, a washing machine, a thermos bottle, thermometers, a typewriter, and a baby-grand piano. Dolls were used to help demonstrate the various health activities.

Materials supplied by the school were used, including art, sewing, and shop supplies. The other required materials for the construction and furnishing of the house were donated or bought with a very small amount of school funds.

On the health mountain in the background was a series of stepping-stones to health, each connected by an orange ribbon with a red arrow to the scene of some particular activity illustrated in the house. Across the top of the background frame was the following label giving the name of the exhibit: The Surely Win (Shirley Wynne) Health House.

Eighty-five pupils, ranging in ages from four to fifteen and from grades kindergarten to 5A and the junior shop, composed the group who created the prize winning exhibit.

Gladys M. Lynch,
In charge of exhibit,
P. S. 43, Manhattan,
Samuel Viertel, Principal.

Children's Fair Requirements, Group Entry Class V E:

Improvement of Our Health.—The best exhibits showing some phase of public or individual health improvement; first-aid, safety, etc.

MILK—FROM PASTURE TO HOME

This project was really a health project, although it had its origin in the grade geography work. The geography syllabus for the New York schools prescribes the study of milk for the early part of the term in the 4A grade. While studying milk, the children found that it was one of the most important foods of mankind the world over. They also learned that the milk was supplied by many different animals. The class, naturally, was most interested in the animal that supplied the milk they drank. Since the children of the city find their milk only in bottles or cans, the desire arose to secure some information about the animal that supplied their milk and how the milk found its way from the cow to the bottle.

The exhibit was built on a platform, four feet square. It consisted of four divisions, each of which was one foot square. The construction of the first two, the pasture and the barnyard, illustrated the study of the appearance, shelter, and care of the cow. In the third division, loading the milk cans on to the train for transportation to the city dairy was correlated with the geography work. The fourth division, showing the milk being enjoyed at the table in the home, permitted lessons in the health program.

The pasture scene included a stretch of grassland, a stream, a few trees, and a herd of cows. The grass was a kind of green sawdust-like composition which is used for laying dust in sweeping floors. The stream was a strip of blue paper covered with crinkled cellophane paper to give a wet appearance. Small twigs topped with pieces of dyed sponge made the trees. The cows, loaned by the children, were obtained from their games at home. A fence, made of matchsticks and wire, enclosed the pasture.

In the barnyard setting, the main piece was a cross-section of a barn. This was made of a cigar box painted red without and lined with white paper within. One end was divided into stalls in which were placed some more toy cows. A silo made of paper was attached to the side of the barn. A corral for horses, a pen for sheep, and several lead figures of milkmaids and farmhands were added for atmosphere.

A railroad station, showing a milk train waiting to be loaded, composed the third setting. The train, waiting-room and baggage-room, automobiles, and figures were loaned by the children. The road and sidewalks leading to the station were cut from gray cardboard. The grass was represented by the same kind of substance as that used in the pasture. One of the automobiles at the station was a truck which was loaded with milk cans made of tinfoil by the children. One of the figures on the platform was a farmhand pushing a wheel barrow containing milk cans.

The fourth setting was considerably larger in scale than the others. It represented the interior of a room in a city home where two children were at breakfast. Floor and walls were made of heavy cardboard covered with colored paper. The floor covering, a checked design in crayon on drawing paper, was made during a measuring and construction period. Curtains for the windows and dresses for the dolls were sewed by the girls of the class. Dollhouse furniture and miniature dishes were loaned. The glasses and milk pitcher were filled with fine salt to give an appearance of being filled with milk.

The only labels were the title, "Milk—From Pasture to Home," and four small cards bearing numbers to denote the sequence of the settings. The title, a strip of printed lettering, was tacked to the front of the project platform. The lettering was all done by the children. The letters were worked out first on quarter-inch graph paper and then traced on oak-tag.

The entire class, composed of forty-seven pupils, took part in the construction of the project. The ages of the children range from nine to twelve. The work covered a period of one month. That allowed one week apiece for each setting.

Celia G. Dellmore,
In charge of exhibit,
P. S. 6, Queens,
Harold LeComte, Principal.

Children's Fair Requirements, Group Entry Class VI E:

Conditions Necessary for Plant Growth.—The best exhibits showing the effect on plant life of soils, of light, heat, moisture, etc. Bulbs or potted plants or terraria may be used.

PLANT REACTIONS TO DIFFERENT CONDITIONS

The project was correlated in a measure with the geography work of the grade. By observing the reactions of the plants to the different conditions of life governing their growth, the children could be made to realize more vividly the remarkable fecundity of plant life in the tropics where conditions for plant growth are the most favorable.

The exhibit consisted of four pots of geraniums, two pots and a water-filled jar with narcissus bulbs, two small water-filled jars with onion bulbs, and three cigar boxes filled with different kinds of soil, showing the reactions of the plants and bulbs to various conditions.

Two geranium pots were placed in the darkness of the classroom wardrobe closet; one was watered, the other was not. The other two geranium pots were placed on the window shelves; one was watered, the other was not. One narcissus bulb was placed over the mouth of a water-filled jar and placed in the light; one was put in a pot, was exposed to the light, but not watered; one was allowed to develop roots, was put in a pot and cared for under as favorable conditions as possible. Both onion bulbs were placed over the mouths of water-filled jars and exposed to the light; one onion was whole, the other had its top slightly cut off.

One cigar box was filled with rich garden soil; one, with sandy soil; the third, with a mixture of the other two with small stones and pebbles. All the material was brought in by individual children of the class.

The labels used were as follows:

Geranium.—

1. Showing the effects of darkness and no water. *Result:* No growth.
2. Showing the effects of darkness and water. *Result:* Leaves are pale but soft.
3. Effect of sunlight and no water. *Result:* Leaves are slightly pale and brittle.
4. All conditions necessary for plant growth are favorable. *Result:* A fine, healthy, geranium.

Narcissus Bulb.—

1. Effect of no water, with sunlight. *Result:* No growth.
2. Effect of water and no sunlight. *Result:* Poor growth.
3. Subject to all conditions necessary for plant growth. *Result:* Excellent development.

Onion Bulb.—

1. Effect of water, early stage.
2. Effect of water, later stage.

Forty pupils, from ten to twelve years of age, prepared the exhibit.

Elsie Keyes, }
Philip Strobel, } In charge of exhibit
P. S. 29, Brooklyn,
E. F. Pertsch, Principal.

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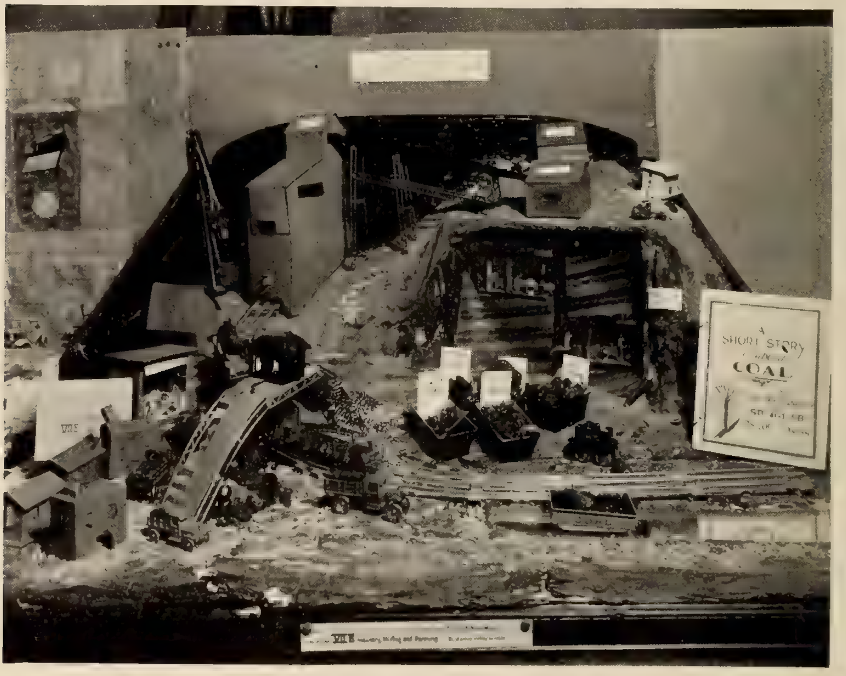
Children's Fair Requirements, Group Entry Class VII E:

Industry, Mining, and Farming.—The best exhibits showing where man gets the raw materials which he uses, and how he uses these materials.



COALVILLE

The scientific objective of this exhibit was to illustrate the operation and mechanical needs of the coal mining industry, with a glimpse of life in a mining community. This particular project was chosen since a study of the mining industry is required by the fifth year course of study in geography.

In the background of the exhibit was a mountain sloping from the right to the left. The front view of this mountain showed a cross-section of a coal mine including two levels, coal cars, miners, and an elevator shaft. The elevator shaft led to a shaft house situated on the top of the mountain directly above the elevator. From this point a conveyor carried the coal to the breaker house in the left background. The company coal office and the little white infirmary were found to the rear of the shaft house. From the breaker house, tracks with coal cars on them were seen sloping down towards the right foreground. At the right front these tracks ran parallel to the water and a coal barge was being loaded. The dilapidated huts and general store were located at the left foreground. There also was a bridge crossing the tracks. Between the tracks and the cross-section of the mine, an interesting exhibit of the various sizes of coal was placed. The entire project was dotted here and there with miners, trucks, cars, coal, and implements that conveyed the vivid impression of a bustling mining town.

All the materials used in this project were brought in and made up by the children themselves under the usual guidance and supervision of the teachers. We were particularly fortunate in having the use of the workshop on the fourth floor. At one bench, children constructed coal cars out of P. & G. soap, and painted them dark gray. At another bench, a group of boys with an Erector set, wood building set, and available cardboard created the various houses, viz., the breaker house, shaft house, infirmary, company office, and the miners' huts. The terrain of the exhibit was created in a very novel manner. Materials used were newspaper, flour, water, green paint, sand, and small stones. The mixture of flour and water was spread thinly over moistened crumpled newspaper and allowed to settle and harden. When thus hardened, it was dabbed with green paint together with fine sprays of dark sand and small stones. The cross-section of the mine was constructed out of a large wooden box, and the two levels of specially fitted cheese boxes. The seams of the mine were made out of sandpaper, which was painted black and gray by a committee of girls. Wood for the platform was brought in, and was built according to specifications prepared by a committee of boys.

The entire exhibit was labeled, "Coalville, A Typical Mine City." Smaller labels appearing on various articles were as follows:

"Coalville Coal Co., Main Office," "Coalville Breaker House," "Shaft House," "Cross Section of a Shaft Mine," "Infirmary," "Coalville General Store," "Buck Coal," Pea Coal," Nut Coal," "Egg Coal" and "Stove Coal."

The work in this project was further correlated and embodied in a loose-leaf book especially prepared, and entitled "A Short Story About Coal, by the Boys and Girls of 5B1 and 5B3 of P. S. 205, Brooklyn." In this story, committees of two or more wrote compositions on the various phases of the industry, with such typical topics as "Dangers in a Coal Mine," "Our Coal Supply," and "Various Kinds of Coal."

In all, there were about eighty pupils actively engaged in one phase or another of this work. They were boys and girls of 5B1 and 5B3 of our school, and the average age was 9½ years.

The pupils were encouraged to consult various references such as "The Book of Popular Sciences," "The Book of Knowledge," and others obtained from the school library and the various branches of the public library. All of this research information and discussion was made a necessary prerequisite to the actual building of the exhibit.

As a result of this project, the teachers sincerely believe that these children gained a clearer and richer idea of this branch of industry in our country. Any one of these pupils is easily qualified now to talk several minutes extemporaneously about the mining of coal and its related subjects.

M. SAIKIN AND L. HERLING,
Teachers in charge of exhibit,
P. S. 205, Brooklyn,
Joseph Griffin, Principal.

CHILDREN'S FAIR REQUIREMENTS, GROUP ENTRY CLASS VII E:

INDUSTRY, MINING, AND FARMING.—The best exhibits showing where man gets the raw materials which he uses, and how he uses these materials.

FISHING IN CANADA

The geography of 6A begins with a study of Canada. The study of fishing is an important phase of the work, an effect of the geographical controls of Canada. As pupil activities always enliven classroom work, I welcomed the announcement of the Exhibit to be held by the Children's Fair. Of the many topics suggested, the children chose "Fishing off the Newfoundland Banks" as an interesting one to learn more about.

We wanted to get accurate information concerning the Children's Fair. Therefore, 6A3 wrote, for their week's composition work, letters asking for detailed information. The children read their letters to the class and the best letter was chosen to be sent to the Museum. Our class received a very cordial reply and we were started on our work.

A chief engineer was elected by the class to solve the problems of construction. It was decided to show the story of fishing from the time of catching the fish to their final destination—the dining table. The class was divided into small groups who conferred over the various problems involved.

Pieces of wood were brought to class by some of the boys. The construction group nailed together an open box, four feet long and three feet wide, which formed the stage for our exhibition. Another group of boys constructed three platforms for the three parts of the exhibit, and other boys sawed the partitions to their proper size.

Then we were ready for the first stage setting—"How We Catch the Fish." Two boys designed and constructed a fishing vessel, using pictures from our school Nature Room as their models. Another boy painted the vessel with water-colors, and another printed the name on its bow. By vote of the class the ship was christened "Jonas Bronck," the name of our school. For the waves, cardboard was procured, cut, painted, and adjusted with pins. The sky was made by using water colors on oak-tag. Seagulls were flying about on the sky because the class artist learned that these were the proper birds to accompany the "Jonas Bronck." We needed fishermen to steer the vessel. This problem was solved by the girls, who dressed two dolls in green oilcloth made like real fishermen's outfits. The children made use of their knowledge of ellipses (6A drawing) by making cardboard barrels for the deck of the vessel.

The next stage setting showed the factory. A boy brought an Erector set and from knowledge gained from moving pictures, articles and photographs, the boys constructed a factory where fish were being prepared for market. Three girls made the factory walls and floors. Boys were chosen to make tables on which to place fish. The entire class worked diligently in making enough fish to supply the tables and drying racks of the factory. The girls designed and sewed the costumes of the factory workers.

The third section showed a family grouped about a dining table, eating a fish dinner. The class used one of the drawing periods to make original designs for wallpaper. The class voted for the best design. The girl whose work was chosen used her design for the dining room walls. Rugs were made on looms, and the best placed on the floor. The class made pictures for the walls and the best were hung up. The furniture was designed, executed, and painted by the boys. The girls sewed the curtains and the clothing of the family.

Our work in constructing this section gave me an opportunity to have a number of interesting lessons on the proper diet of children and what a model home should be like.

This exhibit was made by a 6th year class, ranging in age from eleven to fifteen. The class consisted of 43 children, and each member contributed something to the exhibit.

CELESTE EDELL,
Teacher in charge of exhibit,
P. S. 43, Bronx,
Elias Silberstein, Principal.

ELEMENTARY SCHOOLS

Grades 1 to 6

INDIVIDUAL ENTRY CLASSES

Children's Fair Requirements, Individual Entry Class E E:

The Stars and the Solar System.—The best home-made astral lantern or "star-box" showing the constellations, or the best model showing phases of the moon, or the changes of seasons and their causes, or the best home-made telescope, or the best model showing the planets.

AN ECLIPSE OF THE SUN

My project was connected with our nature study about the stars, phases of the moon, eclipse of the sun, the distant stars, the moon circling around the earth, and the distance of the stars from the earth.

The exhibit consisted of two charts. One had drawings of the phases of the moon; the other chart had the moon shutting off the light of the sun upon the earth to show the shadow of the moon during an eclipse of the sun. Three people were shown looking at the eclipse.

The label was "The moon throws its shadow on the earth, shutting off the rays of the sun."

The material for the exhibit consisted of two houses made by the Edison Company, artificial grass, and gravel for a path. Drawings of the eclipse were placed above the houses. My teacher gave the class some drawings to do. I made the best drawings, so she chose me to do the project. The project was taken from a picture in the "Book of Knowledge" showing the eclipse of the sun.

Joseph Folotico, Age 11,
P. S. 180, Brooklyn,
Jacob I. Milsner, Principal.

Childrens' Fair Requirements, Individual Entry Class F E:

Rocks and Minerals.—The best collection of building stones, or of minerals found in ores, of minerals illustrating crystal forms, or of home-made crystals (salt, alum, sugar, etc.), or of kinds of soils. These specimens should be labeled carefully and arranged according to origin, composition or use.

FERTILE AND UNFERTILE SOILS

The objective of this exhibit was to show the different kinds of soils and their different values for growing plants. The exhibit was made up in a box, showing a farm scene in the center with growing grass, and on either side, specimens of soils with the following labels:

Fertile or Top-Soils:

Peat or Muck-soil.—Formed of decayed vegetation. Found in bogs or swamps. Mixed with sand or clay, makes a very good soil for growth of plants.

Clay Top-soil.—This is clay mixed with humus, which is decayed vegetation. A very good soil for growth of plants.

Sandy Loam.—A good soil for growing, but dries out quickly in hot weather.

Unfertile or Sub-Soils:
- Blue Clay.
- Yellow Clay.—There is also Red Clay.
- Gravel.—This is very common in Long Island.
- Sand.—Forms sea beaches and deserts. Found locally and in all parts of the world. Mixed with cement and used for building.

Above and in the back were three experiments showing results of fertile and unfertile soils, with explanatory labels attached. The one on the left was a square glass dish, through which could be seen the soil, with a tall growth of grass. At the right was a chunk of unfertile soil with practically no vegetation. In the center was a box divided in half. One half contained fertile soil and a good growth of grass, and the other unfertile soil and poor, sparse grass. A label ran across the front of this box, explaining that the grass had all been planted at the same time, and the difference in growth showed the difference in the soil.

John Diem, Age 12 years,
P. S. 52, Manhattan,
Benton Louis Snyder, Principal.

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JUNIOR HIGH SCHOOLS

Grades 7 and 8 and First Year High School

GROUP ENTRY CLASSES

Children's Fair Requirements, Group Entry Class II J:

Biological Principles.—The best exhibits illustrating a biological principle, such as adaptation, including protective coloration, seasonal change and other forms of adaptation; struggle for existence; evolution; other significant biological laws. Labels should be as brief as possible but should state the meaning of the exhibit.

ADAPTATIONS FOR SEED DISPERSAL

This exhibit was gathered and worked out by the biology pupils in the first term class of the Flushing High School, Annex No. 107. The object of our experiment was to show, by concrete examples, various ways by which fruits and seeds are adapted to seed dispersal. Throughout our biology work we strive to see how the structure of plants and of animals is adapted to the work which is required of them. This subject of seed dispersal gave the pupils an opportunity to do their own searching in fields, woods and gardens. It helped them to put into action our class motto, Agassiz's "Study Nature, not books." Working for a collection that would be worthy of exhibition at the Children's Fair added a strong incentive to the search for materials.

The pupils who participated in making the collection were mostly fourteen or fifteen years old. Forty pupils, members of five biology classes, actually contributed the specimens used. It was a source of great interest to all to watch the growth of our collection. Very few of the pupils were familiar with the seeds which they brought in, and each student was much pleased when it was found that a specimen collected showed some adaptation which would give it a place in our Riker mounts or glass jars that were to be sent to the Fair. The interest and information that the collection brought to the pupils made me feel that the real prize was won before the exhibit left the school.

About fifty varieties of fruits and seeds were displayed in six Riker mounts, size 8×12 inches, purchased from Kny-Scheerer at a cost of fifty cents each. Typewritten labels under the glass called attention to the type of adaptation displayed there, and each specimen had a typewritten label. The mounts and their contents were as follows:

1. "Wings are adaptations for seed dispersal on these seeds." Examples.—Maple, elm, birch, linden, pine, tulip, hornbeam, ailanthus, ash.
2. "Downy tufts render these seeds buoyant for dispersal by wind." Examples.—Clematis, thistle, milkweed, dandelion, pampas grass.
3. "Mechanical devices are used here to eject seeds." Examples.—Wistaria, sweet pea, poppy, wild cucumber, touch-me-not, violet.
4. "Tiny hooks in these seeds catch on the coats of animals and this brings about dispersal." Examples.—Burdock, cocklebur, beggar tick, ticktrefoil.
5. "Edible fruits offer substantial rewards in return for dispersal of seeds." Examples.—Asparagus, bittersweet, beechnut, acorn, black walnut, dogwood, rose.
6. "Safety in numbers. Surely some will fall on good ground." Examples.—Bayberry, barberry, locust, jimson weed, sycamore, sweet gum, catalpa, rice, wheat.

Besides these mounts fifteen glass jars (discards from the pantry shelf, brought in by pupils) showed pine and hemlock cones, cotton bolls, etc. Seeds of water plant were displayed floating in a glass of water. Cocoanut husks showed their adaptation for scattering the enclosed embryos, their ability to float away from the parent plant. The florist's appreciation of the beauty of structure displayed by seed pods was shown by a vase of gaily tinted poppy capsules, teasel, milkweed pods, etc.

One large label read as follows: "Adaptations for seed dispersal, in order that seedlings may have more light, more room, more water." It had a central position on our background.

May R. Hamilton, Teacher in Charge of Exhibit,
Flushing High School, Annex P. S. 107, Queens.
Arthur L. Janes, Principal.

Children's Fair Requirements, Group Entry Class IV J:

Science in Home and City Life.—The best exhibits showing an understanding of the part which science plays in the modern home and city. This may include a general survey or may be limited to some special phase. The title of such a display might be, "Science in our City," "Physics in the Home," "Chemistry in the Home," "Application of Biology in the Home," "Science in the Kitchen," "Science and Recreation," "Electric Signs," etc. These exhibits may include models, charts, photographs, etc.

FOOD MODELS TO SHOW A BALANCED DIET

We read and hear a good deal about calories, vitamins and balanced diet. In our study of biology we learn of the types of food that are best to be eaten and why. Scientific investigators such as McCullum, Mendel, Eijkman, Goldberger and others, have shown that health and growth depend a good deal upon the proper selection and proportion of the different nutrients eaten each day. With these facts in view, we decided to show the school children who visit the Children's Fair what is considered to be a good, typical example of a balanced diet for one day.

Our exhibit consisted of charts, and models of foods made of bees' wax or gelatin. For breakfast we recommended an orange, oatmeal, milk, toast, butter, and cocoa. For dinner we had lamb, potato, spinach, cooked tomatoes, whole wheat bread, milk and prunes. Supper was cream-of-corn soup, cooked carrots, toasted bread and butter, glass of milk, and rice pudding.

The number of calories needed depends upon age, sex and size, and also upon the region of the world where we live. A sixteen year old girl needs 2400 calories. A sixteen year old boy needs 2700 calories.

The foods mentioned above are made in the following manner: Make a plaster cast of the orange, oatmeal, butter, lamb, potato, spinach, prunes, and rice pudding. After the mould is made, fill it with bees' wax. Before pouring wax into the mould, add oil paint resembling the color of the food made. To thin the oil paint add turpentine. When making the potato and orange, use a two piece mould. If you rotate the mould while the wax is cooling, the food will become hollow, thus needing less wax.

Wax spinach is made by first cooking real spinach for a few minutes, placing it on a plate, patting it down well and shaping it as desired to give a natural appearance. Now pour plaster of Paris over the spinach, thus forming the mould.

The toast model is made by using ordinary toasted bread dipped into hot bees' wax. If any of the wax solidifies on top of the bread, slightly heat the bread. This will give a natural appearance.

Milk models are made by dissolving Cox's Gelatin according to directions given on the box. To whiten the "milk" add half a teaspoonful of zinc oxide powder, stirring well. By adding about one third of a glassful of glycerine to each glass of milk, the water in this preparation will not evaporate easily. To prevent this milk from becoming mouldy add any colorless antiseptic to it.

After the models are made, color them with oil paint to make them resemble the original food.

A list of the foods we used, and their caloric values, follows:

Breakfast.—Orange, 100 calories; oatmeal, 100; milk, 100; toast 100; butter, 100; cocoa, 100. Dinner.—Lamb, 200; spinach, 50; tomatoes, 25; bread (2 pieces), 200; butter, 100; milk, 150; prunes, 100. Supper.—Cream-of-corn soup, 100; carrots, 50; bread, 200; milk, 100; rice pudding, 100.

Five pupils participated in the preparation of this exhibit. Two of these boys went to The American Museum of Natural History and were shown how the wax foods are made. They then returned to school and taught the process to the other boys.

David Leffler, Teacher in charge of exhibit,
Elijah D. Clark Junior High School,
P. S. 37, Bronx,
Albert S. Taylor, Principal.

Children's Fair Requirements, Group Entry Class VIII J:

Transportation and Communication.—The best exhibits showing the growth and development of modern methods of transportation, of communication, or of both. Models, pictures, etc., may be used.

TRANSPORTATION AND COMMUNICATION

The scientific objective of the exhibit was to give the pupils a better understanding of their environment. This was done by pointing out the scientific principles underlying modern transportation and communication, and by tracing their development in the United States. The broader objectives may well be stated in the words of the Course of Study in Science: (a) "To show that science, by giving man more comforts and greater leisure for enjoyment and cultural development, is a potent factor in human betterment and social improvement." (b) "To lead the pupils to appreciate the praiseworthiness of human endeavor by which the materials and the laws of nature are used and applied for the benefit of mankind."

The exhibit was devised to illustrate the development of water, land, and air transportation in the United States, and the correlated development of communication.

The boys used wood from packing boxes, odds and ends of Erector and Meccano sets, cardboard, reed, and canvas. Most of this material they collected in their homes or in the neighboring stores.

The four levels of the exhibit illustrated water, land, and air transporation and communication. Beginning at left, the water and land transportation were divided into 18th, 19th, and 20th Centuries. The rest of the labels named the models. They were as follows:

Water Transportation.—18th Century: Canoe, raft, sailing vessel; 19th Century: Fulton's Folly; 20th Century: Tramp steamer, ocean liner, coal barge, and tug.

Land Transportation.—18th Century: Horse, stagecoach; 19th Century: Covered wagon, early locomotive, first automobile; 20th Century: Modern locomotive, truck.

Air Transportation.—Early biplane, dirigible, Sikorsky amphibian.

Communication.—Franklin's printing press, modern type, model of Morse's telegraph, model of Bell's telephone, cross country telegraph lines, broadcasting station of New Jersey, modern telegraph key.

There was a backdrop showing the skyline of the city of New York, with the river traffic in the foreground and a blimp overhead.

About forty-five boys worked upon models for the exhibit, although all the models made were not used in the final exhibit. The pupils were from twelve to fifteen years of age.

The labels, with the supports for them, and the backdrop were made in the drawing classes of our school.

Our boys were very much interested in preparing their own exhibit, and also profited greatly by their study of the other exhibits at the Fair. We appreciate the fact that the Children's Fair gave us this opportunity to motivate our work.

Anna Feick, Teacher in Charge of Exhibit,
P. S. 73, Bronx,
Miss Mary A. Regan, Principal.

JUNIOR HIGH SCHOOLS

Grades 7 and 8 and First Year High School

INDIVIDUAL ENTRY CLASSES

Children's Fair Requirements, Individual Entry Class A J:

Biological Principles.—The best exhibits illustrating a biological principle, such as adaptation, including protective coloration, seasonal change and other forms of adaptation; struggle for existence; evolution; or other significant biological laws. Labels should be as brief as possible but clear, and should state the meaning of the exhibit.

SOME ODD ADAPTATIONS IN INSECTS

Ever since I was a very small boy I have liked science. As far back as I can remember, I have gone out in the country with my parents. My interest there was in the natural environment, in the butterflies, birds, trees, and flowers all around me. Thus I began to study and love nature, this eventually leading to the formation of a hobby, then narrowing down to a very interesting part of nature, the study of insects, entomology.

My exhibit consists of a glass-topped box in which the insects are mounted on white "platforms" against a black background. My whole exhibit is entitled: "Some Odd Adaptations in Insects." Specifically, it consists of the following specimens, with descriptive labels:

Order Lepidoptera:

Suborder Rhopalocera: The complete (seven stages shown) life history of *Grapta interrogationis.*

Suborder Heterocera: The complete life history and habits (nesting, etc.) of *Malacosoma americana.* The complete life history and habits of *Melalopha inclusa.* Life history of the bag-worm (*Thyridopteryx ephemeraeformis*). Peculiarities of a wood-boring glass-wing moth, mimicry, habitat, etc.

Order Diptera:

The robber flies, three species shown. *Dasyllis thoracica; Asilus sericeus; Erax rufibarbus* in the act of catching prey, etc.; mimicry, etc.

Order Coleoptera:

Caterpillar hunters. *Calosoma calidum* and *scrutator* in the acts of hunting and killing.

Order Hymenoptera:
  - Showing parasitism. *Spilochalcis mariæ* in a *cecropia* cocoon, and Braconid cocoons on a tomato worm.
  - Life history and (nesting, etc.) habits of *Polistes annularis.*
  - Life history and (nesting, etc.) habits of two species of Masons —*Sceliphron cementarius* and *Chalybion caeruleum.*
  - Life history and wood work of Carpenter ants—*Camponotus pennsylvanicus.*

Galls:
  - Order Hymenoptera:
    - Parasite of *Amphibolips confluentus. Disholcaspis duricaria. Callirhytis punctatus. Biorhiza forticornis. Diastrophus nebulosus. Solenozopheria vaccinii.*
  - Order Lepidoptera:
    - *Gnorimoschema gallaesolidaginis.*
  - Continuation of Order Lepidoptera:
    - Protective coloration of a *Catocala.*

As help I have used Holland's "Butterfly Book" and "Moth Book," and Lutz's "Field Book of Insects." The artificial materials I have used are: a common butterfly net, cyanide bottle, pincers, setting board and other setting apparatus, a special piece of apparatus designed by myself for blowing caterpillars, and other minor things.

During all parts of the year there are specimens to be found. In April, I collected the eggs of the American Tent Caterpillar, although they may be seen all through the winter. In winter I procured most of my galls, their makers hatching soon afterwards. Then followed the bag-worm, Hymenoptera, Lepidoptera (raised at home), Coleoptera which I got while night hunting, and then the *Catocala* and the *inclusa* homes in autumn. I have done most of my collecting in July, when I was in the country, although a good part of my insects were obtained in the vicinity of New York.

I have on my exhibit over 100 labels comprising about two or three hundred words. I have three kinds of labels, one kind bearing Latin names, another illustrating stages, etc., and the third bearing written explanations.

My exhibit is now on exhibition in the library of my school.

Leon Recht,
Age, 14 years.
Yorkville Junior High School,
Albert Loewinthan, Principal.

Children's Fair Requirements, Individual Entry Class C J:

Astronomy.—The best home-made star-box or astral lantern showing the constellations; or a model showing phases of the moon; or a model showing changes of the seasons and their causes; or a photograph of the moon; or a home-made telescope; or a collection of home-made lantern slides of constellations.

AN ASTRONOMICAL TELESCOPE

Perhaps one of the biggest fields of science still open to intensive study and discovery is Astronomy. What we already know we probably owe to Galileo, who first discovered the telescope. Wouldn't that be sufficient reason for one to build such a telescope to see things Galileo saw?

This opportunity came to me when my teacher informed me of a Children's Fair at The American Museum of Natural History on December 4, 1930. I would make this project at our science club work-meetings.

Securing the aid of my father who owns a plumbing establishment, I set out to determine what lenses I should need. From our 8B science course I knew both to be convex lenses, but of what focal lengths? My teacher informed me that the magnifying power was equal to the ratio of the objective lens to the eye-piece lens. I traveled downtown and secured two lenses, one of 32 in. focus and the other of 4 in. focus, both second-hand and costing $4.00. A new pair, I found out, would cost $12.00.

The telescope itself was cut from 2 in. nickel-plated tubing, and the stand from ⅜ in. galvanized pipe. The center support fitted loosely to allow freedom of motion from left to right. An eye-socket point allowed vertical motion.

Irving Weingarten,
Age 12.
P. S. 36, Bronx,
Hannah B. Walsh, Principal.

Children's Fair Requirements, Individual Entry Class H J:

Science in Home and City Life.—The best exhibits showing understanding of the part which science plays in the modern home and city. This may include a general survey or may be limited to some special phase. For example:—"Science in Our City," "Physics in the Home," "Chemistry in the Home," "Application of Biology in the Home," "Science in the Kitchen," "Transportation and Communication in a City," "Science and Recreation," "Electric Signs," etc. These exhibits may include models, charts, photographs, etc.

THE CONTROL OF HOUSEHOLD PESTS

The object of the exhibit was to show people coming to the Children's Fair how to control and to kill pests they might be bothered with at home. This subject was part of hygiene which I studied a short time ago.

The exhibit was made up of six experiments dealing with the six leading pests, the fly, mosquito, clothes moth, roach, bedbug, and house ant. There were two parts to each experiment, one showing the growth, and the other the control of that particular pest, *i.e.*, a miniature swamp with mosquito larvæ and the identical swamp with a film of oil over the swamp to stop the breathing of the larvæ.

As far as possible, I developed the different life stages in my insects. I had several mosquitoes and mosquito larvæ. I kept about twenty live moths in a box with cotton for several months and obtained hundreds of moth eggs, larvæ and pupæ. There were some flies and two pupæ, several roach pupæ, and some roaches. I had numerous ant eggs and many ants. My greatest achievement was to get four bedbugs, which are rare and exceedingly hard to find, as their thickness is about 1/32 of an inch.

What I didn't know about the insects I looked up in the New York Public Library.

The exhibit was placed on a white enameled box. Three experiments were on top of a box and three on the table, with the cards explaining each standing at the back of them. A piece of cardboard, 16×20 inches, with the object of the exhibit, stood in back. The following labels described the experiments.

House Fly.—Breeds in refuse heaps. Carries typhoid germs. Destroy by drenching the refuse with formalin and water, or burn egg masses.

Mosquito.—Pierces our skin and sucks our blood. Lays eggs in swamps. The larvæ that hatch are controlled by spreading a film of oil over swamp to stop breathing.

Clothes Moth.—The eggs are laid in any material with fibres, such as woolen cloth. The larvæ have biting mouth-parts. Fumigate with sulphur to kill eggs, larvæ, etc. Also put clothing in sunlight from time to time.

Roach, or Croton Water Bug.—Hides in crevices and cracks near food or water. It feeds on our food. Roach paste on moist bread will kill roaches. To destroy nest, soak with gasoline to kill eggs and larvæ.

Bedbug.—It sucks our blood. Comes out at night. Lays eggs in mattresses and cracks in bedroom. Their presence can be determined by small black spots on mattress. To destroy nests, drench with gasoline.

House Ant.—Has nests in ground where it lays eggs. The nests are destroyed by soaking with gasoline or carbon bisulphide.

Julian B. Rotter,
Age 14,
Abraham Lincoln High School,
Gabriel R. Mason, Principal.

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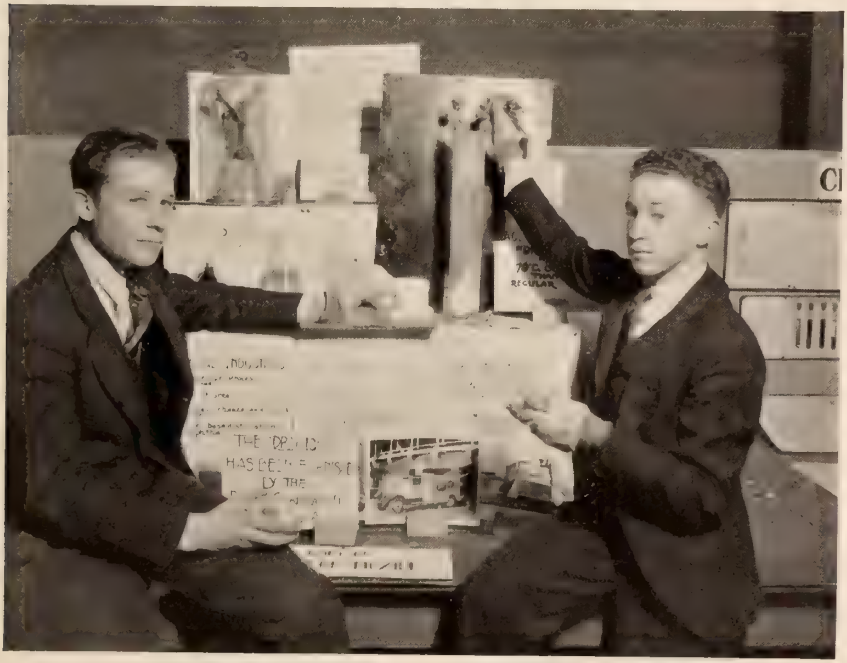
HIGH SCHOOLS

Second, Third and Fourth Years

GROUP ENTRY CLASSES

CHILDREN'S FAIR REQUIREMENTS, GROUP ENTRY CLASS III HS:

CHEMISTRY.—The best exhibits of home-made apparatus, models or devices which illustrate important chemical principles or processes. In each case attached cards must state the principle or process, and make clear the intent of each part of the exhibit. Parts should be easily observable, and relations between them should be easily traceable. In making awards, the importance of the subject, the simplicity and originality of the model, and the ease with which the exhibitor's intention may be grasped, will be items which receive chief consideration. Examples: Models to illustrate manufacturing processes such as making of glass, paper, artificial silk, cast iron, sulfuric acid, soap; and different things made in the electrical furnace; oil-refining, etc.; or apparatus or models, original if possible, to illustrate important chemical experiments such as oxidation, reduction; atomic and molecular structure, ionization; types of chemical action, allotropism, organic reactions, etc.



CARBON DIOXIDE DEMONSTRATION

The scientific objective of this exhibit was to give a few experimental indications of the industrial possibilities of Carbon Dioxide, especially in the form of "Dry Ice." This work is connected with our classroom studies in that it constitutes one of the major units in chemistry.

The exhibit consisted of three parts:

1. Charts.—(A) To explain the experiments, and (B) to outline the uses of Carbon Dioxide.

2. "Static" Experiments, that is, experiments which were set up and remained exhibits for a period of time.—(A) Preservation of flower buds: six rose buds were purchased. Three were placed in water under a jar in which a piece of "Dry Ice" was placed. This served to produce an atmosphere largely of carbon dioxide. The other three buds were placed in water and exposed to the air. As time went on the latter buds opened and wilted. The buds in carbon dioxide remained closed for about a week. At the end of this time they were removed and exposed to air. These buds opened in the natural way. (B) Rejuvenation of cold storage eggs: into one of three petri-dishes a fresh egg was opened, preserved with formaldehyde, and covered with water-glass. Into a second petri-dish was placed an opened cold storage egg, and this was treated in the same way. Into a third petri-dish was opened a cold storage egg which had been kept, in its shell, in CO_2 for thirty-six hours. It was preserved in a similar manner.

   The yolk of the cold storage egg was flat and spread greatly. The yolk of the fresh egg was high and compact. The yolk of the rejuvenated egg was also high and compact.

3. Experiments Demonstrated.—(A) Drop a piece of "Dry Ice" (handled with gloves) into a cylinder of water. The warm water vaporizes the "Dry Ice" and gives the effect of boiling water. (B) The Singing Coin: a groove is made in a

chunk of "Dry Ice" by means of a coin, so that if theco in is inserted it remains almost upright. The coin is warmed by rubbing between the hands and then inserted in the groove. The warm coin vaporizes the "Dry Ice," which causes vibration of the coin and results in a sound. (C) Freezing experiments: objects such as a hollow rubber ball, a piece of rubber tubing, etc., were immersed in crushed "Dry Ice." On removal they were hard and brittle.

Seven pupils, from sixteen to eighteen years old, participated in preparing the exhibit. Each day, at an appointed hour, two of the boys gave the demonstrations.

A. H. Dick, Teacher in charge of exhibit,
Theodore Roosevelt High School,
William R. Hayward, Principal.

Children's Fair Requirements, Group Entry Class VI HS:

Value and Protection of Forests, or Flowers, or Birds or Other Animals.—The best exhibits showing why our forests or wild life need protection and how this protection can be given.

DEFORESTATION CAUSED BY FIRE AND CARELESS LUMBERING

This exhibit was made for the purpose of illustrating the deforestation caused by fire and careless lumbering. In making our model we first constructed a wooden box, 36 inches long, 14½ inches wide, and 4 inches deep. Next we made a back and sides to support the two hills in the model. The finished box was then given two coats of paint, a primer, and then a coat of dark green. From a nearby beach some ordinary clay was obtained. Using this as a foundation, we erected two hills in the box. On one hill, loose soil and a layer of moss were placed, the moss over the soil. On the other, loose soil alone was placed. Twigs, representing trees, were stuck in the side of the moss-covered hill. Into the side of this hill the bed of a dried-up stream was roughly cut. Between the two hills a narrow stream of tin-foil flowed out into a pond of sheet tin. To improve the work as a whole, we painted on the backboard a blue sky in which, between the hills, a blue-white cloud was outlined.

The materials we used were clay, earth, water, moss, rocks, pebbles, twigs, tin-foil, sheet tin.

The following labels were attached:

1. Humus of Forest Bed. 2. Perpetual Stream. 3. Sterile Soil. 4. Topsoil Removed by Rain. 5. Dry Stream Bed. 6. Careless Lumbering and Fires Caused Deforestation.

One of the best features of this project is that it can actually be seen to function. Before labeling it, a light shower of water was let fall upon both hills simultaneously. Immediate results were obtained. The bare hill was washing away, the bed of the stream was suddenly aflush with water. The moss on the other hill was actively absorbing water which was later to be released gradually, feeding the brook with a constant stream of water. It is indeed an excellent demonstration of the practical value of our forests.

Five students, ranging from 13 to 16 years of age, were engaged in the actual construction of the model. The information was compiled by members of the Biology Club.

Rosina Irving, In charge of exhibit,
Biology Club,
Flushing High School,
Arthur L. Janes, Principal.

Children's Fair Requirements, Group Entry Class VIII HS:

Science in Home and City Life.—The best exhibit showing an understanding of the part that science plays in the modern home or city. This may include a general survey or be limited to some special phase. Examples:—"Science in our City," "Physics in the Home," "Chemistry in the Home," "Biology in our Homes," "Science in the Kitchen," "Transportation" or "Communication" in a city, "Science and Electric Signs." These exhibits may include models, charts, photographs, etc.

SOME MODEL AIRPLANES

The idea behind the exhibit was to make it interesting enough to attract attention and instructive enough to show the progress made in transportation by air.

The exhibit was made by the Clinton Aero Club, a group of boys interested in model building and the study of aeronautics. The work in preparation for the exhibit gave the organization, founded in September, an opportunity to do some cooperative work.

The exhibit was planned with the idea of having historic, old, and modern planes represented. This was attained by showing models of the following: Historic.—Bleriot, Wright; Old Modern.—(War planes) Fokker D–7, SE-5; Modern.—DO-X, Autogyro, Lockheed-Sirius, Sopwith and Supermarine.

The space assigned to the exhibit measured from the floor to the ceiling and four by four feet. To get all the planes into this space it was necessary to have some of them suspended in flying position. This was accomplished with the aid of very fine nickel-plated wire and two ring stands.

The materials used were supplied from kits or from material bought in bulk. These materials were mostly Balsa wood, paper, glue, and paint.

The labels were typewritten on library cards and bore the title of the plane and some interesting and instructive facts about it. They were either suspended from the planes (as in the case of those flying) or they were fastened between one wing and the table-top.

Twenty pupils, averaging about fourteen years of age, cooperated in the construction of the models.

Some of the pupils constructed the planes at home with other students who lived near them. Many of the pupils used their study periods to work on their models in the rear of the General Science room, which is equipped with a large bench which gave them the working surface they desired.

The exhibit is now on view in the exhibition room of DeWitt Clinton High School.

CHARLES J. SULLIVAN, } In charge of exhibit,
HERMAN SCHNEIDER, }
DeWitt Clinton High School,
A. Mortimer Clark, Principal.

HIGH SCHOOLS

Second, Third and Fourth Years

INDIVIDUAL ENTRY CLASSES

Children's Fair Requirements, Individual Entry Class A HS:

Biological Principles.—The best exhibit illustrating a biological principle; such as adaptation, including protective coloration, seasonal change and other forms of adaptation; struggle for existence; evolution or other significant biological laws. Labels should be as brief as possible but clear, and should state the meaning of the exhibit.

ADAPTATION OF INSECTS FOR CARE OF YOUNG

The purpose of my exhibit was to show the adaptation in insect homes for the care of the young. I found that the wood-boring beetle protects her young by laying her eggs in tunnels which she has formed in trees. Here they are packed with food which the larvæ may eat and from which they may develop. The excrescence on the oak tree, called the oak gall, with its hard, brittle, waterproof shell is a protection for the gallfly's eggs. For the larvæ of another gallfly the pulp of the goldenrod affords enriching food. Curious paper homes afford shelter to wasps.

The materials I used in the exhibit were all natural. The various wasps' nests, the eaten wood stump, the galls, and the tent caterpillars' home had been made during the past year by the respective inhabitants. The wood-boring beetle had masticated the remnant of a tree left by some wood-cutters, the larvæ had all departed, and the spring rains had done their work in removing the debris left. So a properly bored old stump remained. The bald-faced hornets' nest was more difficult to secure, for they had not been obliging enough to leave their home, which hung suspended from an old building. Still, most of the insects no longer used their homes. Another original paper manufacturer, *Polistes*, builds a nest, of about six single cells which she attaches with one stem to a rafter in some barn. The *Vespa germanica* puts a sheltering cover over her similar home and chooses out-of-door places as well as indoor ones. Mine had been built on the twig of a young cherry tree. Espying some chicken wire in the attic of our home, the mud dauber had modeled a reposing place for her young. The Cecropia moth securely molds its pupa to the twig of a shrub, while the Promethea cocoon swings from a similar base. A spider (who, although not an insect, is very closely related) had placed her delicate egg cases in among the threads of a web. To me the most interesting insect was the underground-dwelling yellow jacket. A straight tunnel leads down to the stacks of paper combs which are piled one upon the other in the cleverly excavated den.

The insects named were all displayed with labels describing the maker of each nest and where it was found.

ALWIN WINSTEIN,
Age 16,
Wadleigh High School,
Dr. Stuart H. Rowe, Principal.

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CHILDREN'S FAIR REQUIREMENTS, INDIVIDUAL ENTRY CLASS E HS:

ANIMAL HOMES, AQUARIA, TERRARIA.—The best animal home, made by the exhibitor, that meets all requirements of good living conditions; or the best balanced aquarium; or the best home-made terrarium made and arranged with plants by the exhibitor. The accompanying label, chart or record must include information concerning the plants or animals, such as name, habitat, food, water, care, adaptation to life in the wild or domestic state, means of protection, use or disadvantage to man, etc.

A CAGE FOR WHITE MICE

White mice are used for different experimental purposes in laboratories and colleges. Therefore, they are raised in quantities to supply this demand. At Christmas, a year ago, I received a pair of white mice as a gift. They increased so rapidly that I soon found that raising them would be a profitable business, since their litters number from two to thirteen and the price of a mouse is about fifteen cents. When I began I had cages but did not know the proper way of caring for them. I had a plain tin pan in the bottom of the cage with paper in it. This meant that I always had to take out all the mice before it could be cleaned. This was extremely inconvenient, and I mentioned it to one of the teachers in school. This teacher had worked in a place where the breeding of white mice was carried on extensively, and told me that the cages always had double bottoms, the first of wire netting that allows the dirt to go through, and the second of tin which is covered with a paper that catches the dirt. This gave me the idea for the cage which I exhibited at the

MOUSE CAGE
MOUSE CAGE
Purchased Unhygienic

Children's Fair. I made this one circular, but it is the last one. The wire had to be cut so that it would fit in about one inch above the bottom of the sides of the cage. Then it had to be entered evenly all around, which was the hardest work of all. Making the rest of the cage was comparatively easy. I have a cage under construction composed of ten separate compartments, but these compartments are square and are taking only about one-half the time to make. The hygienic principle of the double bottom, however, is still maintained.

After a place to live, the mice, like all other animals, require exercise. Mice cannot go out and take a stroll when born and raised in cages; therefore mechanical means for exercise must be supplied. A wheel is the type generally used. In my cage, I put it inside instead of making a little separate run outside of the main cage. I did this for two reasons. First: It is simpler for a cage of this type. Second: The mice (when the wheel is inside and made out of wire like the cage) like to curl up in its roundness and go to sleep. The wheel was placed about one and one-half inches above the floor, so, if it is revolving, the mice can pass under it without being injured. The wheel was suspended by wires so that when it is in motion, the mice can pass in and out without being caught, as would be the case if stiff supports had been used.

The top of the cage, an inverted cone, was left unfastened so as to have an easy means of access. The wheel, being fastened to the top, holds it on with the aid of a small wire hinge at one side. Thus, when one lifts up the top, the wheel comes out, providing a very easy way to clean the wheel and also the cage, as there is no hindrance inside. The dirt, however, all drops down to the bottom pan which lifts out from underneath the cage.

ROGER BRETZ,
Age 18,
Theodore Roosevelt H. S.,
William R. Hayward, Principal.

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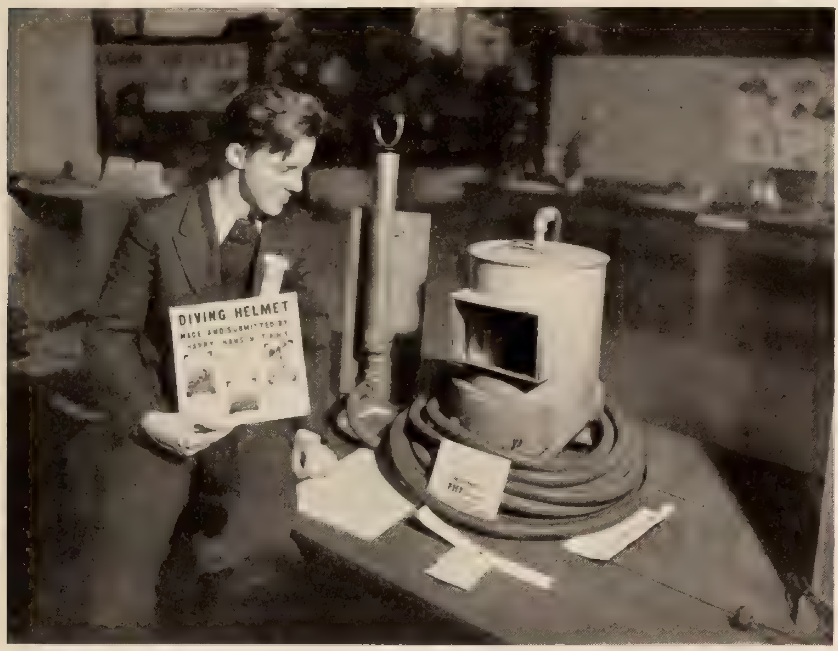
CHILDREN'S FAIR REQUIREMENTS, INDIVIDUAL ENTRY CLASS F HS:

INVENTIONS.—The best original ideas or adaptations of inventions based on scientific principles. The exhibit may take the form of apparatus, models, plans or photographs, and should show new ways of developing old ideas, or entirely new devices, processes or experiments based on the facts and laws of science.



A DIVING HELMET

The diving helmet, with which I was fortunate enough to win a first prize at the Children's Fair, was inspired by my reading William Beebe's "Under Tropical Seas." His vivid description of the sea flora made me wonder whether anything similar could be found in local waters. But my friends and I soon found out to our disappointment that none of the beauties of tropical seas are to be found in this vicinity, where the harbors have been polluted.

It is safe for me to say that there are not many who have the opportunity to dive. Your first dive is an experience not to be forgotten, especially if you know that your head is encased in a discarded gasoline tank. After the equipment is checked and the phones are placed over your head, your friends wish you a cheery goodbye and the helmet is placed on your shoulders. You let go of the boat and begin to descend.

Suddenly you feel a sharp pain in your ears, you feel panicky, and in a nervous voice you speak in the mouthpiece to your assistant and tell him to stop lowering until the pressure on your ears is equalized. You can hear him repeat your order. You give an order to lower away and continue to go down until you touch bottom. This being your first descent you are usually more than satisfied and give a quick order to be pulled up. Each successive dive, however, inspires additional confidence until you lose all fear and find real enjoyment in the experience.

On one occasion we endeavored to put the apparatus to a practical use. A boat had broken away from its mooring and we went down in an effort to locate the mooring chain. If that fellow who was looking for a needle in a haystack really wants to do something big, I would suggest that he find a mooring chain in the bottom of a bay. We didn't!

The material used in constructing the apparatus consisted of part of a discarded gasoline tank, an old garden hose, and a piece of brass tubing, the original use of which still remains a mystery. It made, however, an efficient pump. These parts were all assembled from various junk heaps.

The 'phone system was a later innovation.

In conclusion, I wish to express my appreciation not alone for the prize which was so kindly awarded me, but for the pleasure and real educational benefit derived from examining the various exhibits.

Harry Hanson,
Age 18 years,
Theodore Roosevelt High School,
William R. Hayward, Principal.

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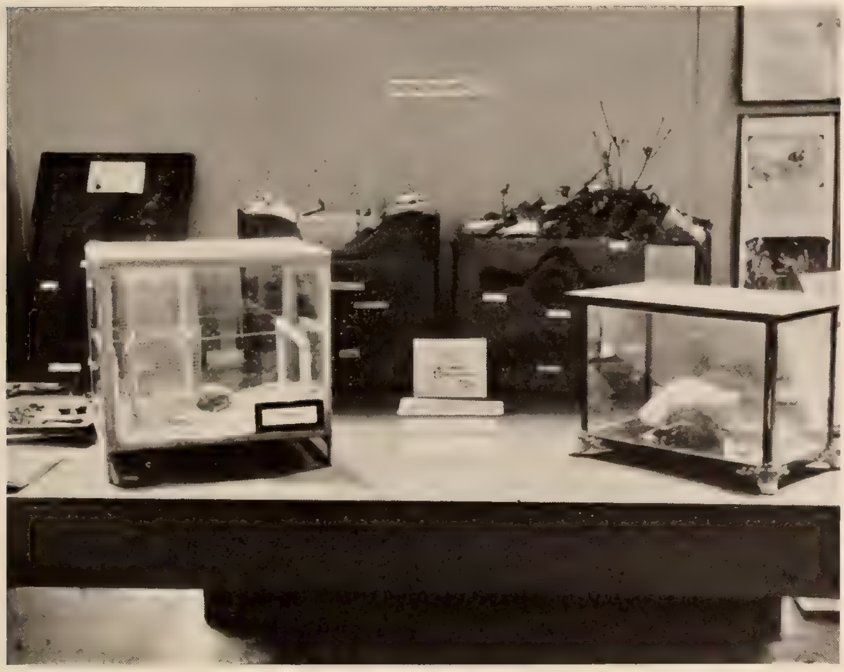
PARKS AND ORGANIZATIONS

GROUP ENTRY CLASSES

Children's Fair Requirements, Group Entry Class I O:

Biological Principles.—The best exhibits illustrating a biological principle, such as adaptation, including protective coloration, seasonal change, and other forms of adaptation; struggle for existence; evolution; or other significant biological laws. Labels should be as brief as possible but clear, and should state the meaning of the exhibit.



HIBERNATION

The scientific objective of this exhibit was to show how, when, and where animals hibernate.

This exhibit had no particular connection with our nature program other than the fact that Scouts should have a fair general knowledge of the ways of animals, and helping to build such an exhibit tends to increase their knowledge along this line. We are starting some of the boys on miniature nature groups somewhat similar to these.

Part of the exhibit was a cross-section model of a chipmunk's burrow, showing a chipmunk in the state of hibernation. The clever way he constructs his tunnels so that there will be perfect drainage if it rains is clearly shown. Also, his store-house of food well stocked with nuts may be seen.

The other model is a cross-section of a pond showing two frogs and a salamander hibernating in the mud below the water. An owl on a stump and a few ducks on the water are enemies that would make short work of the amphibians if they were not snugly entrenched in their winter quarters.

In addition, a cage with live chipmunks and an aquarium with some frogs showed how the animals would keep awake in the winter if kept in warm quarters.

The only living material was the chipmunks and frogs. The chipmunks were kept supplied with fresh water and such food as nuts, bread, crackers, apples, etc. A wheel was in the cage so that they could have proper exercise. An inch of sawdust was on the bottom of the cage. The frogs were in a covered aquarium with about an inch of water. A large rock was in the center, upon which they could come out at will. No feeding was necessary during the week of the Fair.

There was a variety of natural and artificial material used in the exhibit. The main structure of the models was made of plaster-covered wire netting fastened on to a wood base. This was colored with show-card color and glued and sanded to represent earth. Glass was used to represent water. Actual leaves and grass were used on the ground, also some branches and rocks. Dried grass was used for the nest of the chipmunk, and acorns, hickory nuts and butternuts used to fill his storehouse. White plaster of Paris was used to represent snow. The chipmunk, frog and salamander were first modeled in plasteline, and then a plaster mould was made from which they were cast in paraffin and painted in natural colors with oil paints. The owl and the duck were modeled in paraffin on a tiny wire armature and then painted. The natural material was obtained during trips to the woods.

The label on the chipmunk group was as follows:

Eastern Chipmunk (*Tamias striatus*).—Chipmunks are true squirrels but have become terrestrial, living mostly on the ground. They are good tree climbers but are not to be compared with the Red Squirrel.

Their food consists of: grains, nuts, berries, insects, birds' eggs and young mice. They have cheek-pouches and when they are filled, look as though the animal had the mumps.

Many animals prey upon them, as: snakes, hawks, weasels, foxes, wildcats, badgers, and other small carnivores.

The Chipmunk is an inquisitive little chap, venturing closer than any other animal that one may come in contact with in the woods.

Hibernation starts about September to October and lasts till about March and April.

The following label on the group as a whole listed some of the animals that hibernate:

Some Animals that Hibernate.—Bear, chipmunk, woodchuck, jumping mouse, snakes, turtles, frogs, salamanders.

Six pupils, ranging from 14 to 18 years of age, prepared these exhibits.

CORNELIUS DENSLOW, In charge of exhibit,
Boy Scout Division,
Brooklyn Children's Museum,
Anna B. Gallup, Curator.

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CHILDREN'S FAIR REQUIREMENTS, GROUP ENTRY CLASS II O:

VALUE AND PROTECTION OF TREES AND FLOWERS.—The best exhibits showing the value and care of forests, or of individual trees, or of flowers.

VALUE AND PROTECTION OF OUR FORESTS

The scientific objective of the exhibit was to show the "Value and Protection of our Forests." This exhibit served to give us experience for museum work at summer camps.

The exhibit, covering four square feet, was divided so that one piece 4×2 feet was given over to the Value of Forests and the other piece, also 4×2 feet, was given over to the Protection of Forests. There were two large models each two square feet, one showing the natural value of forests and the other showing what is being done to protect forests, Another section of the exhibit, a piece two feet square, showed the value of forests with regard to the manufactured products made from them. There were two small models each one foot square, one showing a forest well taken care of, and the other showing a burnt over area which had once been thickly wooded but had been neglected. These were used as a contrast. The last section, a piece 2×1 foot, had an axe and several matches in it showing the greatest enemies of the forest, and man standing as the one who has made these enemies what they are.

The materials used were plaster board, plaster of Paris, sand, cotton (dyed green), match sticks, manufactured articles made from trees. The plaster board was used to build up the hills and for the bottom of the models. The plaster of Paris was mixed with water and poured over the plaster board framework. The sand was sprinkled on the plaster while it was still wet, to give the appearance of ground. The cotton (dyed green) was wound around match-sticks and shaped to look like trees. The manufactured articles made from trees were used in showing the value of forests.

The following labels were used:

Value and Protection of Forests (placed on wall behind exhibit)

A Typical Well Protected Forest

Fire Lane—the purpose of a fire lane is to stop fires from advancing, as they are free from burnable material.

Fire Tower—a fire tower affords the ranger a place from which any fire within a distance may be seen.

Fire Prevention Signs—these signs are to keep people ever mindful of the dangers of fire and the necessity for prevention. (This label was placed on the large model for prevention.)

Natural Value of our Forests

Humus—this absorbs the water and so stops many lakes and streams from overflowing their banks. (This label was placed on the large model for value.)

Some of the Products of our Forests. (This label was placed before the manufactured products which were exhibited.)

Carefulness did this. Carelessness did this. Which is better? (This label was placed before the two small models, the full grown forest and the burnt over one.)

The Greatest Enemies of the Forest. (This label was placed before the axe and matches.)

Five boys, from 14 to 16 years of age, worked on this exhibit.

Marvin Schneller,
Boy Scout Museum,
Troop 46, Queens,
Donald MacMillen, Scoutmaster.

Children's Fair Requirements, Group Entry Class VI O:

Conditions Necessary for Plant Growth.—The best exhibits showing the effect on plant life of different soils, of light, heat, moisture, etc. Bulbs, potted plants or terraria may be used for this exhibit.

POTTING AND CARE OF PLANTS

The object of the exhibit was to show children and adults the proper care of house plants, the different types of soil needs for different varieties of plants, the correct mixture of soil, the amount of water necessary to promote plant growth, how to water and when to water, and how to avoid and combat insect pests and fungoid diseases. The potted plants were exhibited with the following labels:

Boston Fern.—Soil—rich, equal parts leaf mould, sand, rotted manure, and top soil. Temperature 55°, no extremes. *Dryness* leads to development of pests. *Dampness* induces development of fungoid diseases.

Scotti Fern.—Soil—rich, equal parts leaf mould, sand, rotted manure, and top soil. Temperature 55°, no extremes. *Dryness* leads to development of pests. *Dampness* induces development of fungoid diseases.

Cactus.—Soil—¾ sand, ¼ top soil. Dry, sunny location. Water sparingly.

Begonia.—Soil—½ top soil, ¼ rotted manure, and ¼ sand. Water moderately. Keep in a sunny place.

Rubber Plant.—Soil—rich, equal parts leaf mould, sand, rotted manure and top soil. Temperature 55°. *Dryness* leads to development of pests. *Dampness* leads to development of fungoid diseases.

Aspidistra.—Soil—rich, equal parts leaf mould, sand, rotted manure and top soil. Thrive in almost any location. Water three times a week.

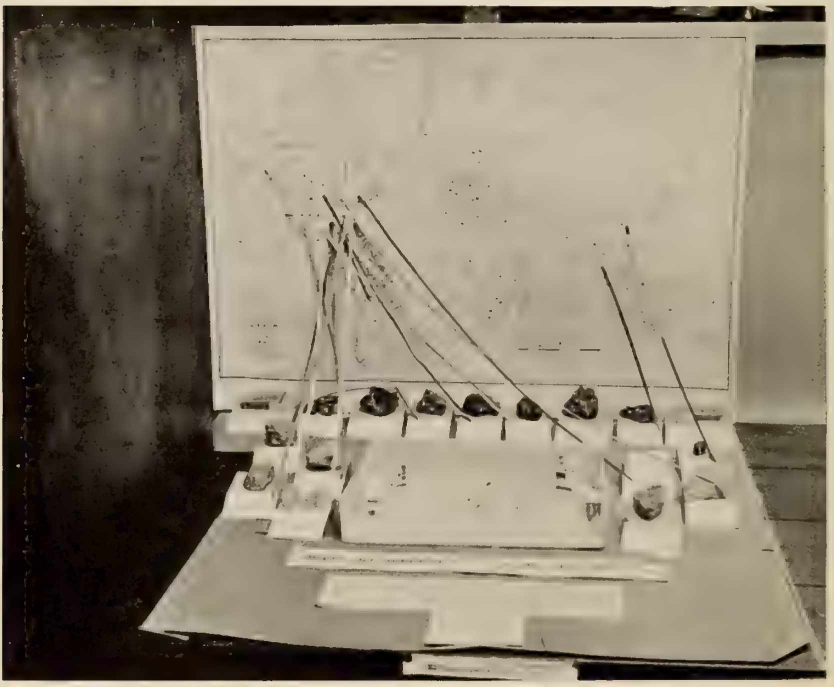
Sansevieria (Snake Plant).—Soil—¼ sand, ½ top soil, and ¼ rotted manure. Will grow well under all conditions. Water sparingly.

Thirty pupils, 9 to 15 years of age, worked on the project.

Edward J. Miller, In charge of exhibit,
Bureau of School Farms.

CHILDREN'S FAIR REQUIREMENTS, GROUP ENTRY EXHIBIT VII O:

INDUSTRY, MINING, AND ECONOMIC CROPS.—The best exhibits showing where man gets the raw materials which he uses, and how he uses these materials.



IMPORTANT MINERALS USED IN THE KITCHEN

The objective was to show some of the more important mineral resources and the use to which the mineral products are put to serve man in even the most commonplace objects and utensils of everyday life. The objects of the ordinary kitchen were chosen to illustrate the project.

The exhibit was prepared by the Mineral Club, a group which meets at the Museum for the study of minerals, their identification and uses. The study of minerals is a part of the general program of nature study, carried on by the Museum with the objective of assisting the child in orienting himself with respect to his surroundings in the natural world. The child acquires a thorough first-hand knowledge of minerals by handling, testing and carefully studying specimens under the leader's supervision.

The background of the exhibit was a large outline map of the world, on which were shown, by bars of color, the important centers of production of each mineral. A ribbon of the same color ran from the point of chief production to a specimen of the mineral. Each specimen was fastened to a wooden block, and an attached label gave the mineral name and the uses to which the mineral is put in the kitchen. A miniature kitchen with the main items of furniture and cut-out pictures of the utensils and accessories served to show the uses of the minerals. Dots of color, corresponding to the color of the ribbon, were placed on the furnishings and indicated the mineral source of the particular material used in that object.

The map and kitchen furniture were obtained by purchase, and the mineral specimens were borrowed from the Children's Museum reserve supply.

The following labels were used:

Many minerals are used in the furnishing of a house,but the greatest number are usually found in the kitchen. This exhibit shows fifteen of the most important metals and non-metals used in the preparation of kitchen furnishings and utensils.

Each mineral substance has been assigned a color which designates it in all places in the exhibit. A ribbon leads from the specimen to the map and indicates the locality of greatest ore production. Bars of color indicate other important producing areas. A dot of the color is used in the kitchen model to show representative objects made of the mineral.

The label on each specimen gives the mineral name and some of the principal household uses of the extracted mineral.

Cassiterite: ore of tin.—Food containers, plating on utensils, solder.

Sphalerite: ore of zinc.—Pipes, brass, galvanizing, refrigerator linings.

Pyrrhotite: ore of nickel.—Plating on knobs, heating elements, plating of electric appliances.

Ilmenite: titanium.—Enamels, paints, colored glassware.

Hematite: ore of iron.—Stoves and sinks, cutlery, utensils.

Feldspar.—Porcelain, china, glass, glazes, enamel for tiles and utensils, scouring powders.

Galena: ore of lead.—Pipes and solder, paints.

Azurite–Malachite: ores of copper.—Electric wire, brass and copper pipe.

Bauxite: ore of aluminum.—Kitchen utensils.

Barite:—Linoleum, oilcloth, paints.

Wolframite: tungsten.—Electric lights, appliances.

Native Copper.—Electric wire, brass, and copper pipe.

Rutile: titanium.—Enamels, paints, colored glassware.

Quartz.—Glassware and chinaware.

Halite: rock salt.—Food preservative and seasoning.

Chrysotile: asbestos.—Fire-proof materials, stove mats and pipe coverings.

Sulphur.—Matches, rubber goods, paper, paint, insecticides.

Twelve children from 9 to 16 years of age worked on the exhibit, but seven of them did the greater part of the work.

Marion Hubbell, In charge of exhibit,
Brooklyn Children's Museum,
Anna B. Gallup, Curator.

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PARKS AND ORGANIZATIONS

INDIVIDUAL ENTRY CLASSES

Children's Fair Requirements, Individual Entry Class E O:

Astronomy.—The best home-made exhibits of a star-box or astral lantern showing the constellations, or a model showing phases of the moon, or model showing changes of the seasons and their course, or photographs of the moon, or home-made telescope, or collection of home-made lantern slides of constellations.

SEASONAL CHANGES ON THE EARTH

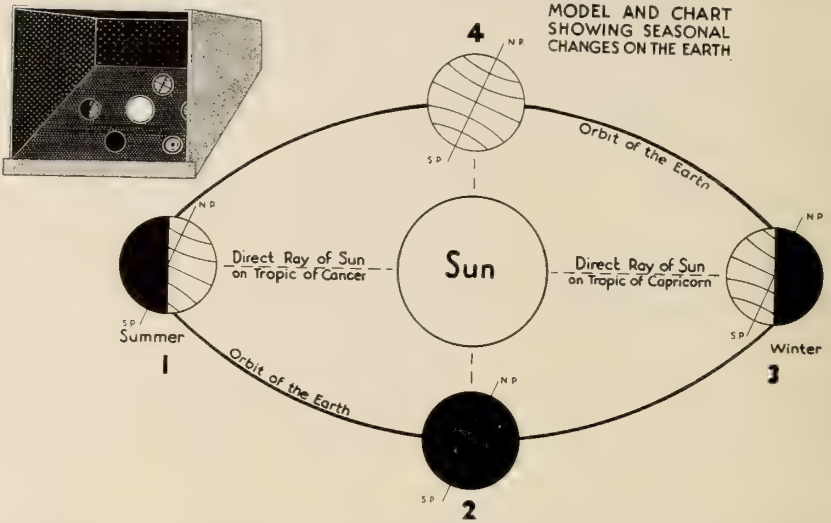
My exhibit illustrated seasonal changes on the earth. Its structure was very simple, and most of the material used was obtained from the five-and-ten-cent store. Four positions of the earth were represented by four ping-pong balls, and the sun, by a red bulb. One half of each "earth" was painted black, and having removed the filament from the red bulb, all five "bodies" were supplied with electric bulbs. The current was derived from two dry cells within the stand upon which the exhibit was built. A break in the current was made, where a push-button was placed so that when it was pushed all the objects would light up at once. This, of course, gave the appearance of a luminous sun lighting up the faces of the earth. The earth's axes were pins, and all slanted about 23 degrees in the same direction. The equator, the two tropics, and a sketch of the map was made on each "face" that was to be lighted by the bulbs.

At the back of the exhibit was a vertical board. Near its base the roof of the exhibit rested. From this board, the roof slanted upward and forward (see diagram), and was supported by two sticks in the front of the exhibit. Drapings of black-cloth were suspended from the roof, thus covering the sides of the exhibit and letting very little light in. In this manner, the lighting up of the "bodies" would be more noticeable, and would create more of an impression. On the same board that suspended the roof, two explanatory papers were tacked. These were simple and direct, and corresponded to the exhibit.

The exhibit was painted black, and may have given the visitors to the Fair one or both of two feelings which I experienced when I made the exhibit: first, a feeling of mystery that one gets when he looks into the sky at night where the secrets of the universe exist, but are yet unfound, or second, a feeling that he or she is looking into space. If people did get these impressions, I feel that my exhibit was successful.

Louis Stark,
Age 14.
Boy Scout Troop 566, Manhattan.

CHART TO ILLUSTRATE SEASONAL CHANGES ON THE EARTH


MODEL AND CHART SHOWING SEASONAL CHANGES ON THE EARTH
4
N P
S P
Orbit of the Earth
Sun
Direct Ray of Sun on Tropic of Cancer
Direct Ray of Sun on Tropic of Capricorn
N P
S P
Summer
1
N P
S P
Winter
3
Orbit of the Earth
N P
S P
2

SEASONAL CHANGES ARE DUE TO THE FACT THAT THE AXIS OF THE EARTH IS INCLINED, AT ALL TIMES, 23½° TO THE NORTH.

Fig. 1.—Position of the earth during June 21–23.

The direct rays of the sun are nearest to our North Temperate Zone at this time when they play upon the Tropic of Cancer. The Arctic Zone is lighted, and the Antarctic Zone is in darkness.

Fig. 3.—Position of the earth during December 21–23.

The direct rays of the sun are farthest away from us at this time, and fall upon the Tropic of Capricorn. Thus it is winter for us, and summer for those living below the Tropic of Capricorn. Instead of the North Pole's being light, and the South Pole dark, the North Pole is dark, and the South Pole is light. Now, too, our nights are long and our days are short, which is the reverse of our summer when the days are long and the nights are short.

Figs. 2 and 4.—Earth's positions during September 21–23, and March 21–23.

These are what are called the equinoxes, or a time when days and nights in both northern and southern hemispheres are equal. The direct rays of the sun fall upon the equator, and the North and South Poles are in dawn and twilight respectively.

Children's Fair Requirements, Individual Entry Class F O:

Geology.—The best collection of minerals illustrating crystal forms; or the best collection of fossils; or the best model showing the form or geological character of a part of the region near New York; or the best series of specimens showing the age of rocks and their changes from one form to another over periods of time; or the best collection of rocks and minerals arranged to show origin, composition or use.

LIFE AS IT EXISTED TEN MILLION YEARS AGO

The purpose of this exhibit of fossils was to give the average person a general idea of the types of plants and animals which lived on this earth approximately ten million years ago. It was during my short vacation in Germany last summer that I first became really interested in the study of fossils, the science of paleontology. At this time, by making trips to the quarries and cement-works of Württemberg on a bicycle, I succeeded in obtaining, from the Triassic and Jurassic rocks, the fossils represented in this exhibit, in a rough, unfinished state. Upon reaching America with my collection, I finished chiseling the fossils out of their surrounding matrixes of rock and otherwise preparing them for display. To find the names of those specimens, which I had not been able to identify in the museums of Stuttgart and Tübingen, I utilized illustrated monographs on the subject found in the New York Public Library.

To hold the smaller specimens while on exhibition, I made a wooden cabinet having four shelves and a sloping glass front. It was about eighteen inches high, two feet long, and nine inches wide at the base. To give the specimens as much light as possible, the shelves, sides, and back of the case were lined with white cardboard. The larger specimens, consisting of flat slabs of shale, were glued to a thick cardboard base in front of the cabinet.

Twenty-seven species of now-extinct plants and animals were represented. Most of them were various types of petrified shells, but fossilized wood, sea-grass, cuttle-fish bones, fish, and Ichthyosaur bones were also displayed. Each species had a label which gave the Latin name of the specimen, and the layer of rock and place in which it had been found. A chart, which I printed in India ink, was fastened to the back of the cabinet, where it could be clearly seen by everyone. On it, short descriptions and pictures of the fossils, and diagrams of the rock formations in which they had been found, helped the visitor to understand the subject more readily, and to obtain a clearer picture as to what the life of that time was like.

Victor Schmidt,
Age 16,
Brooklyn Boy Scout Council.

[illegible] AS IT EXISTED 10 MILLION YEARS AGO

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The program for the Third Children's Fair was prepared under the direction of a Plan Committee·

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